

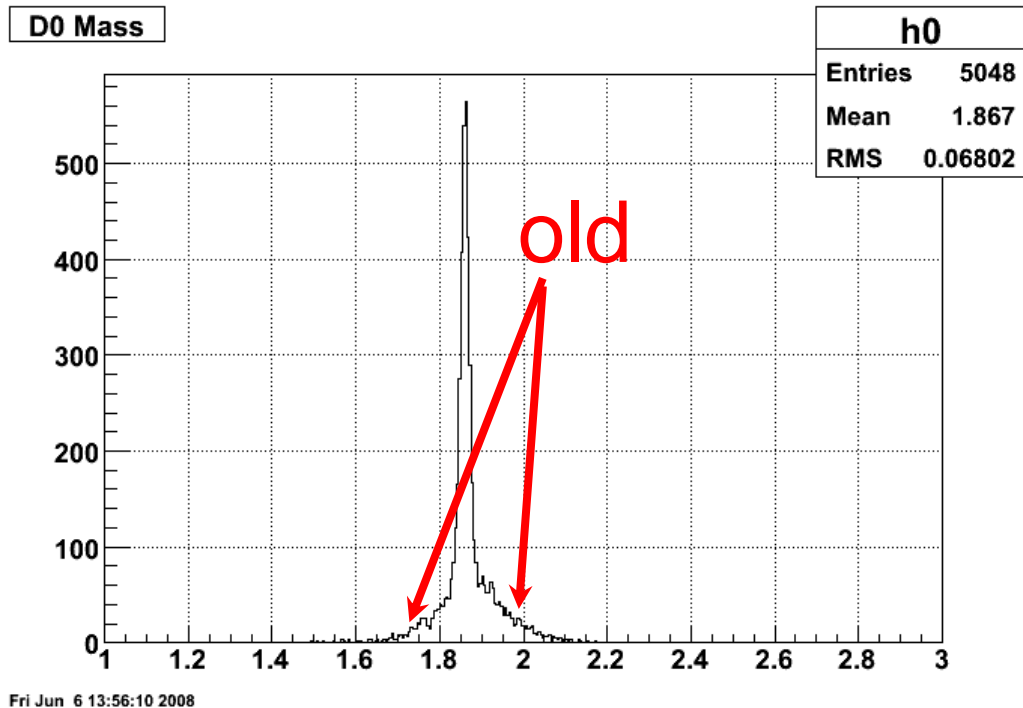
Cuts in MuKpi-update

- pure D0 : 950 MuDst files (400 possibles D0 per file)
- $|Z_{\text{vertex}}| < 20 \text{ cm}$
- $\text{NHitsFit} > 15$
- histos in 2-d to investigate possible cuts

To recall : the method used

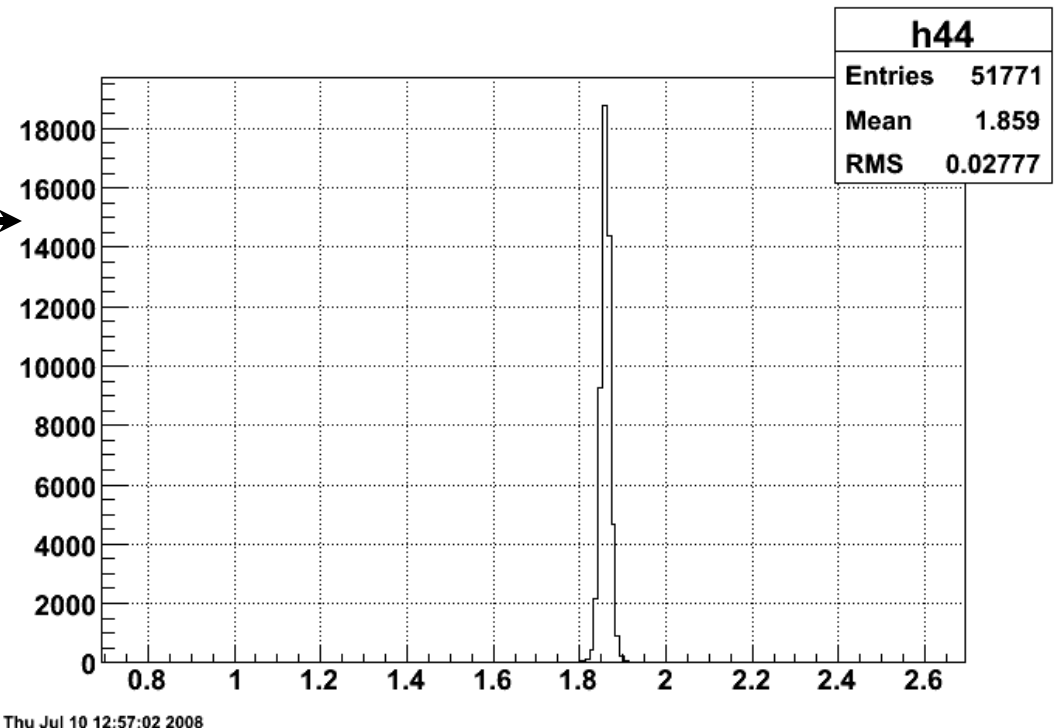
- Aim: To investigate if the reconstruction micro-vertex code [MuKpi.C] can reconstruct D0 parameters correctly and to extract its resolution parameters.
- Use pure D0 sample
- How:
 - 1) Find the good daughters and reconstruct the D0 in MuKpi.C
 - 2) Do the same in geant.root and extract the original parameters.
 - 3) Plot the differences

correction with old plot



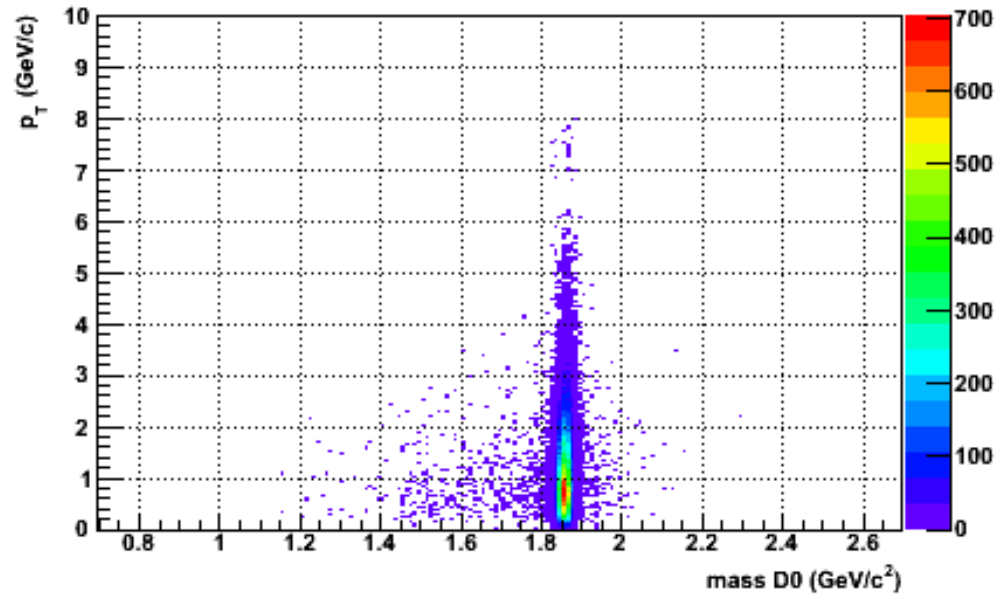
background around mass
D0 due to wrong $K^- \pi^+$
association

better now →

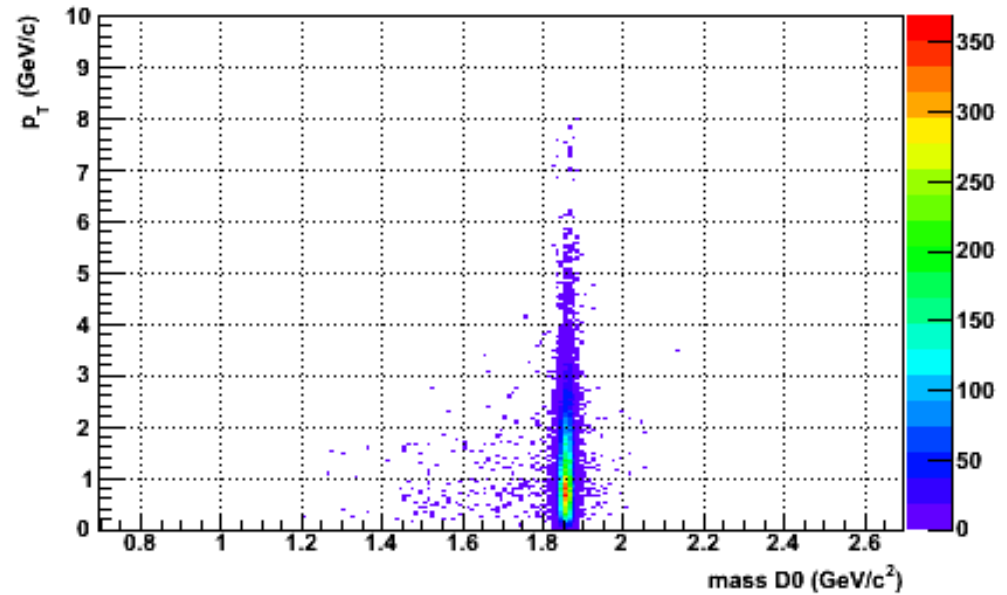


mass D0 vs. p_T^{D0}

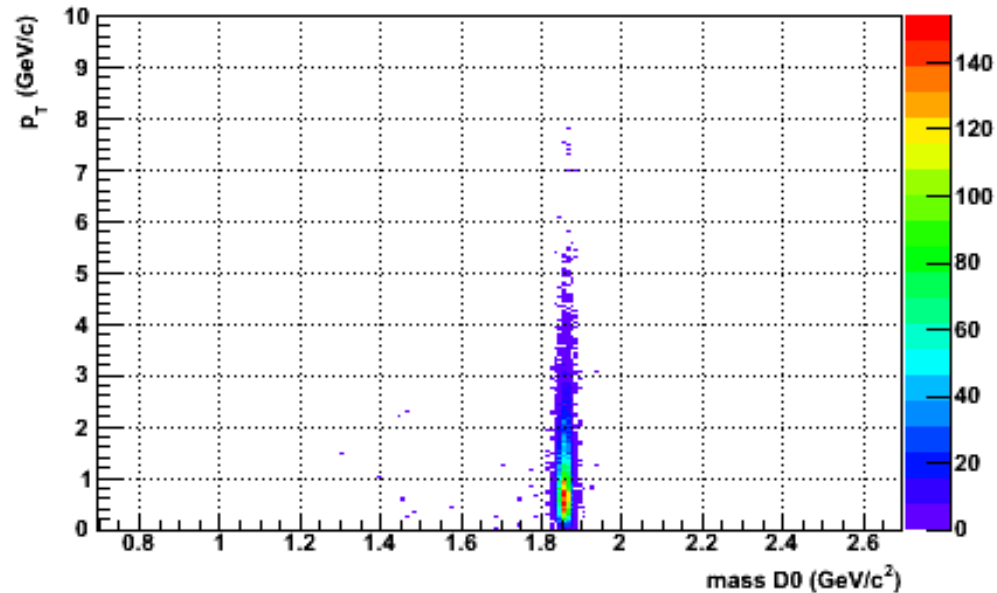
no cuts



cuts on TPC hits

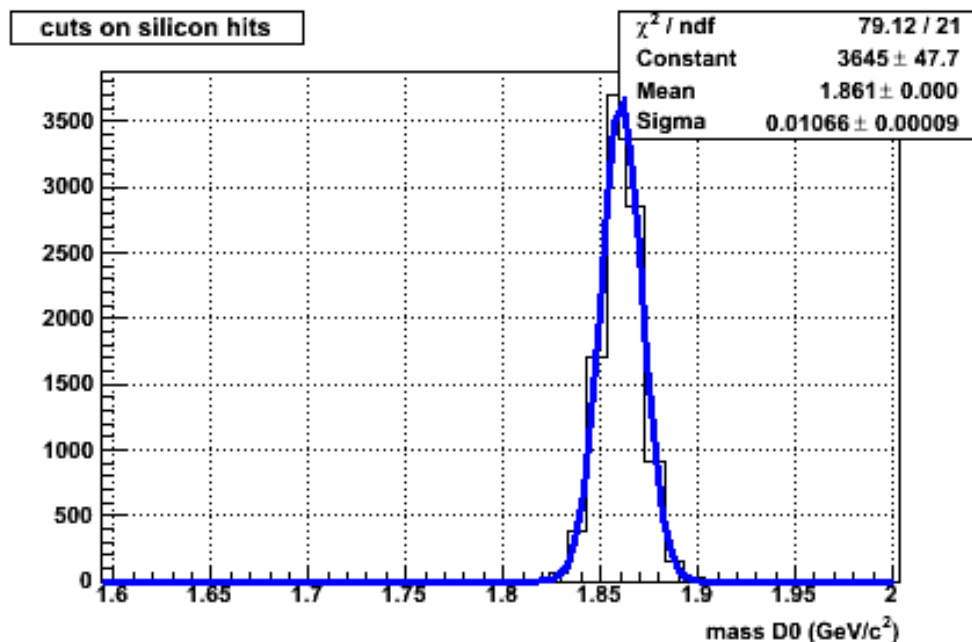
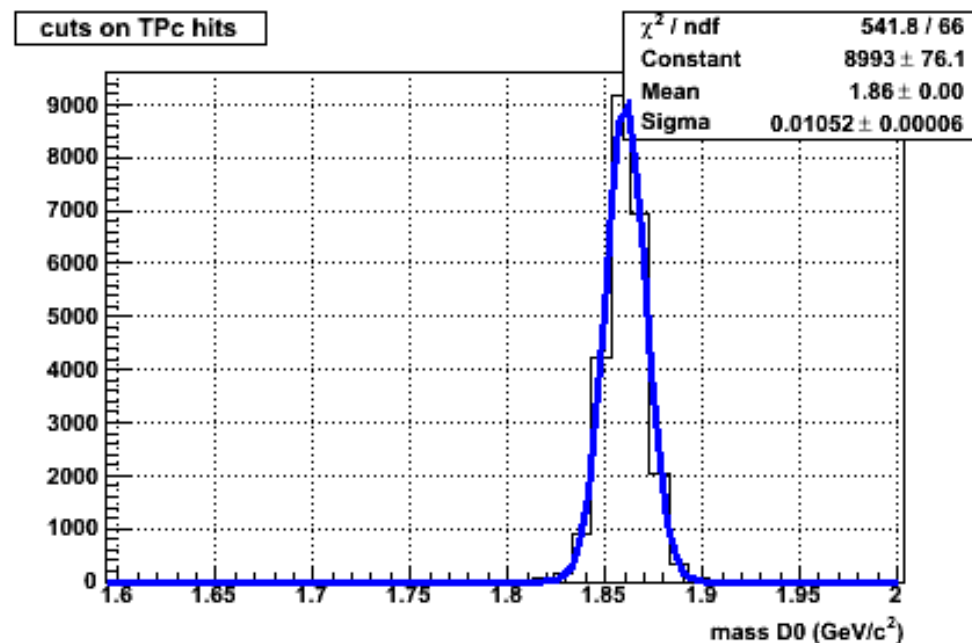
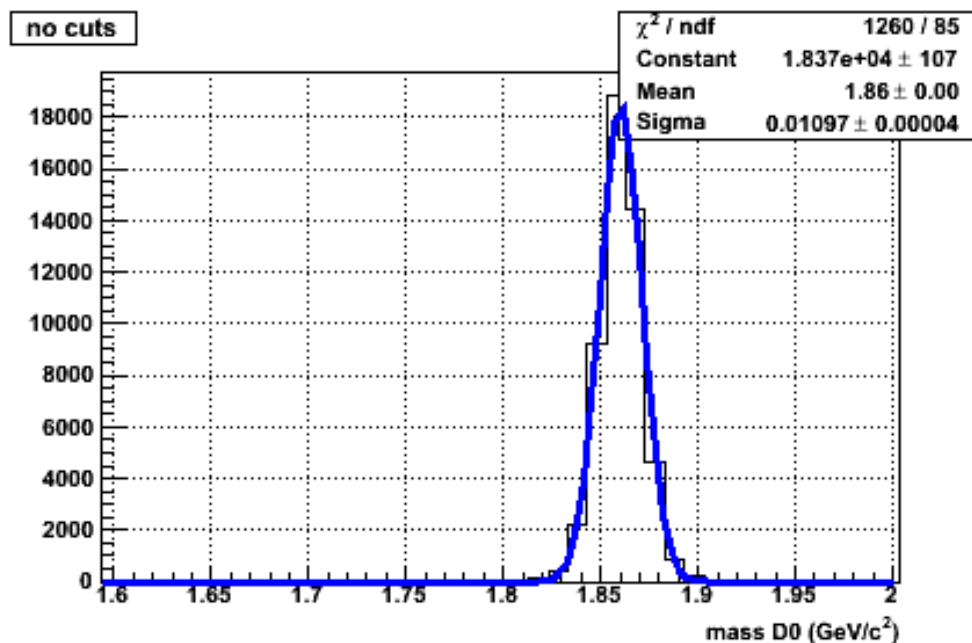


cuts on silicon hits



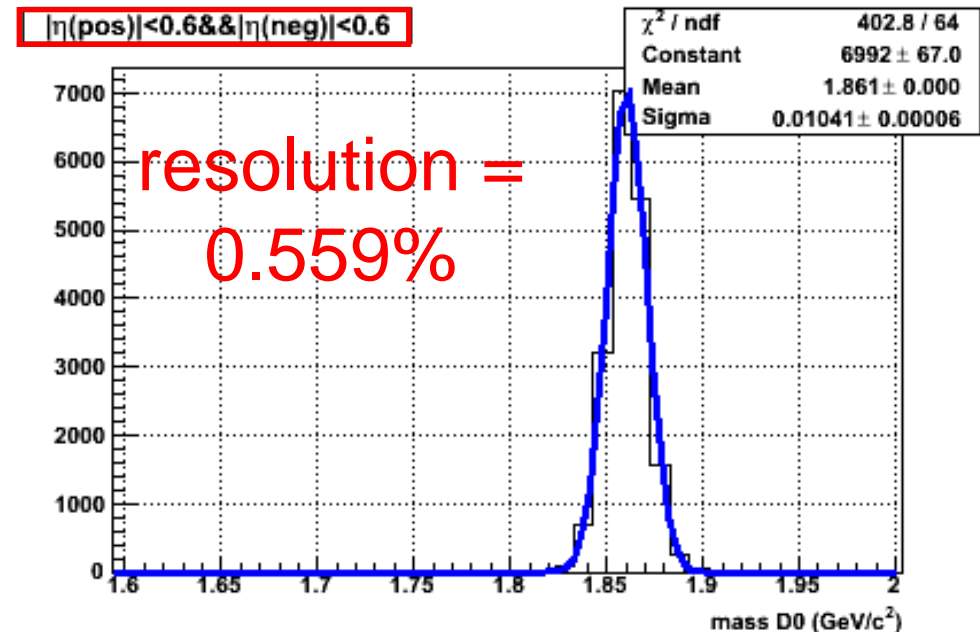
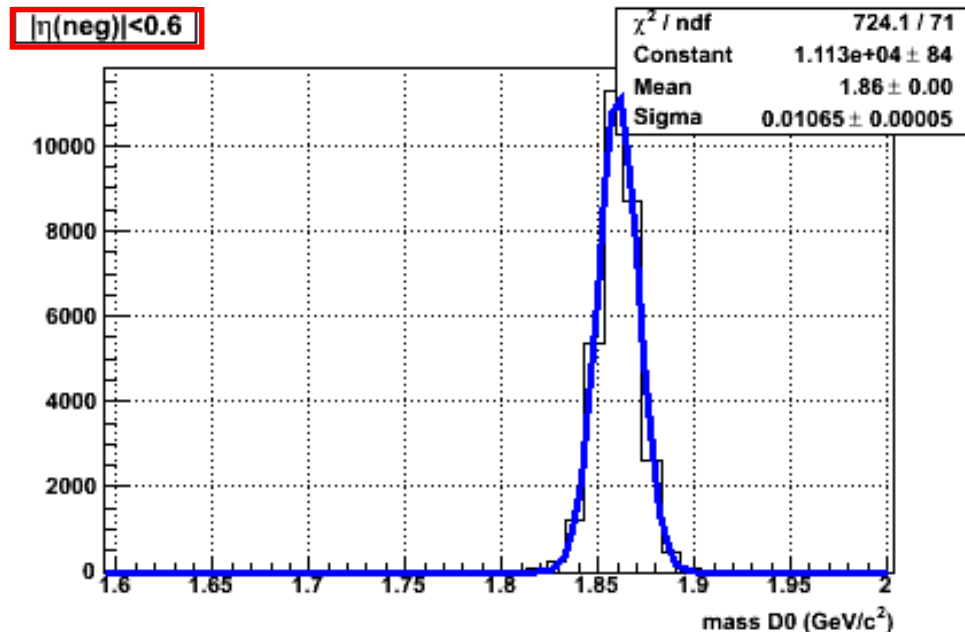
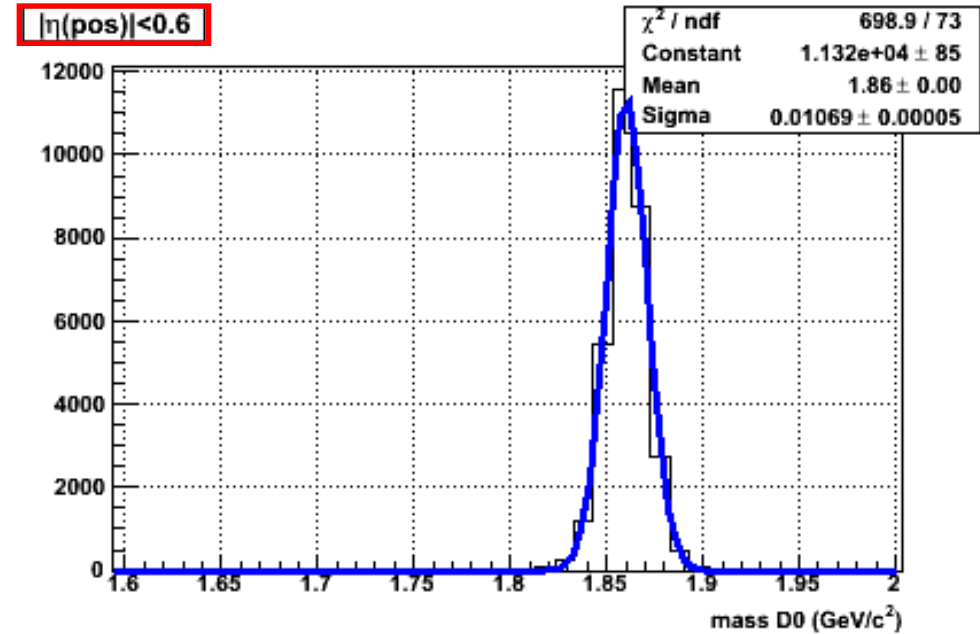
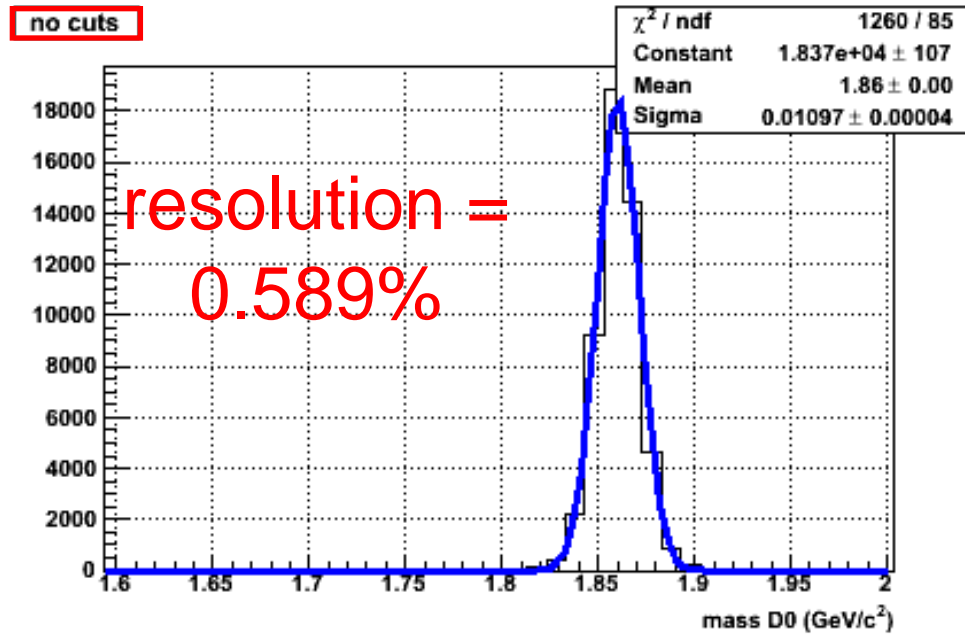
- pad 1 : no cuts
- pad 2 :
 - Hits TPC(pos)>20 && Hits TPC(neg) >20
- pad 3 :
 - Hits in SSD+SVT(pos)>2 && Hits in SSD+SVT(neg) >2

mass D0 (fit)



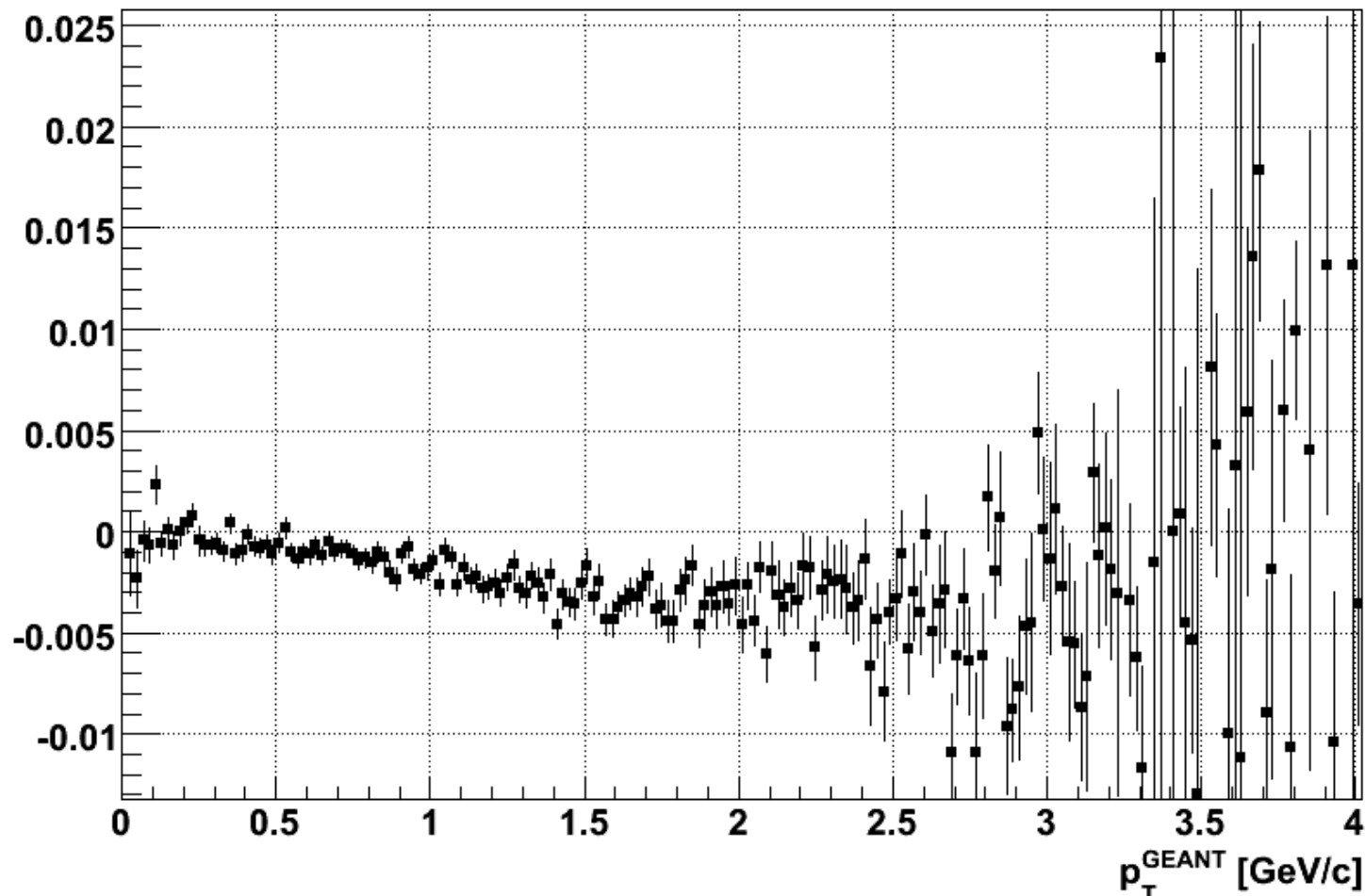
- pad 1 : no cuts
- resolution = 0.589%
- pad 2 :
 - Hits TPC(pos)>20 &&
 - Hits TPC(neg) >20
- resolution = 0.565%
- pad 3 :
 - Hits in SSD+SVT(pos)>2 &&
 - Hits in SSD+SVT(neg) >2
- resolution = 0.572%

mass D0 vs. η daughters



comparison with D0 from Geant : p_T resolution (mean)

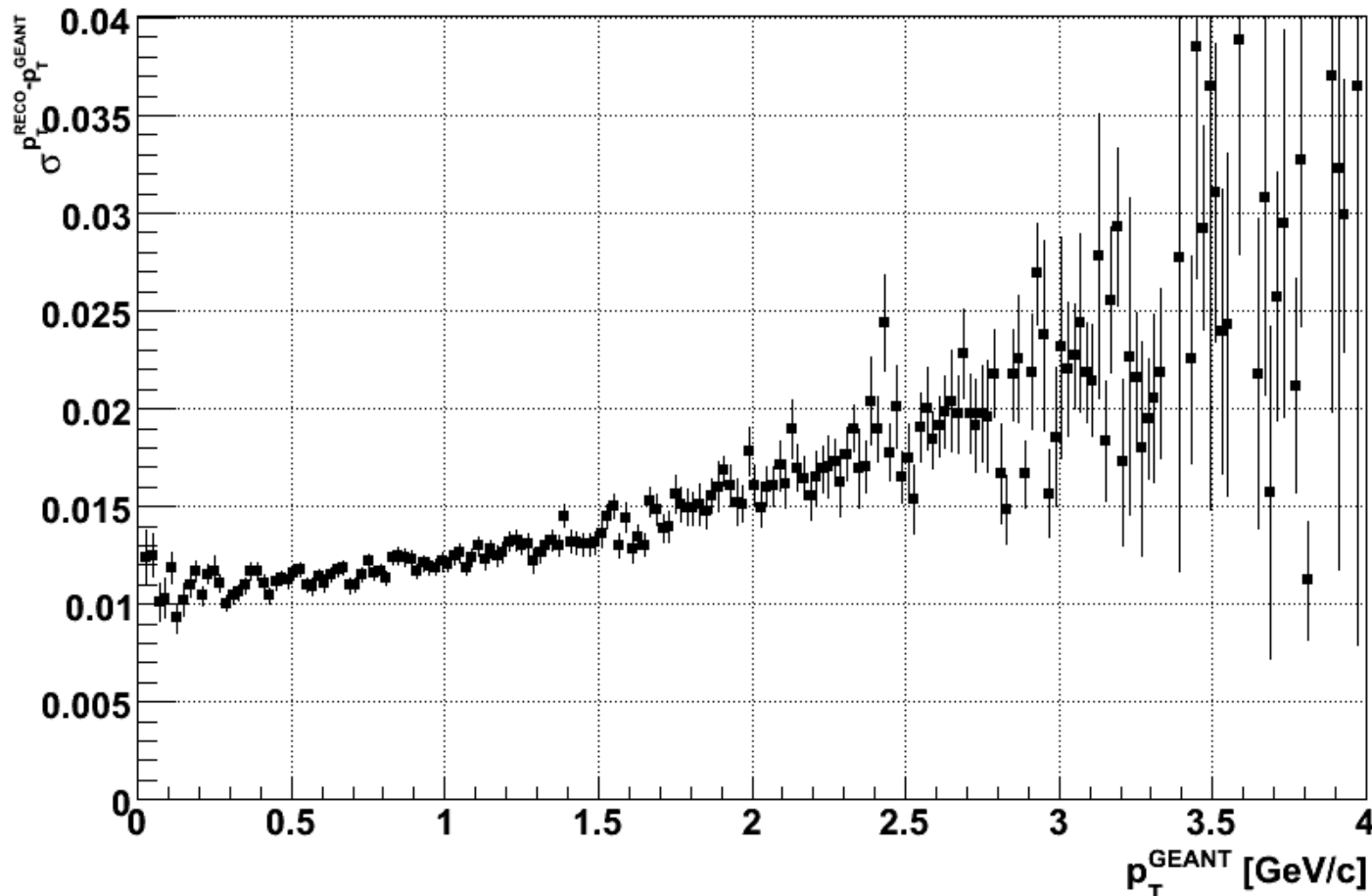
Fitted value of par[1]=Mean



- small shift when p_T increases

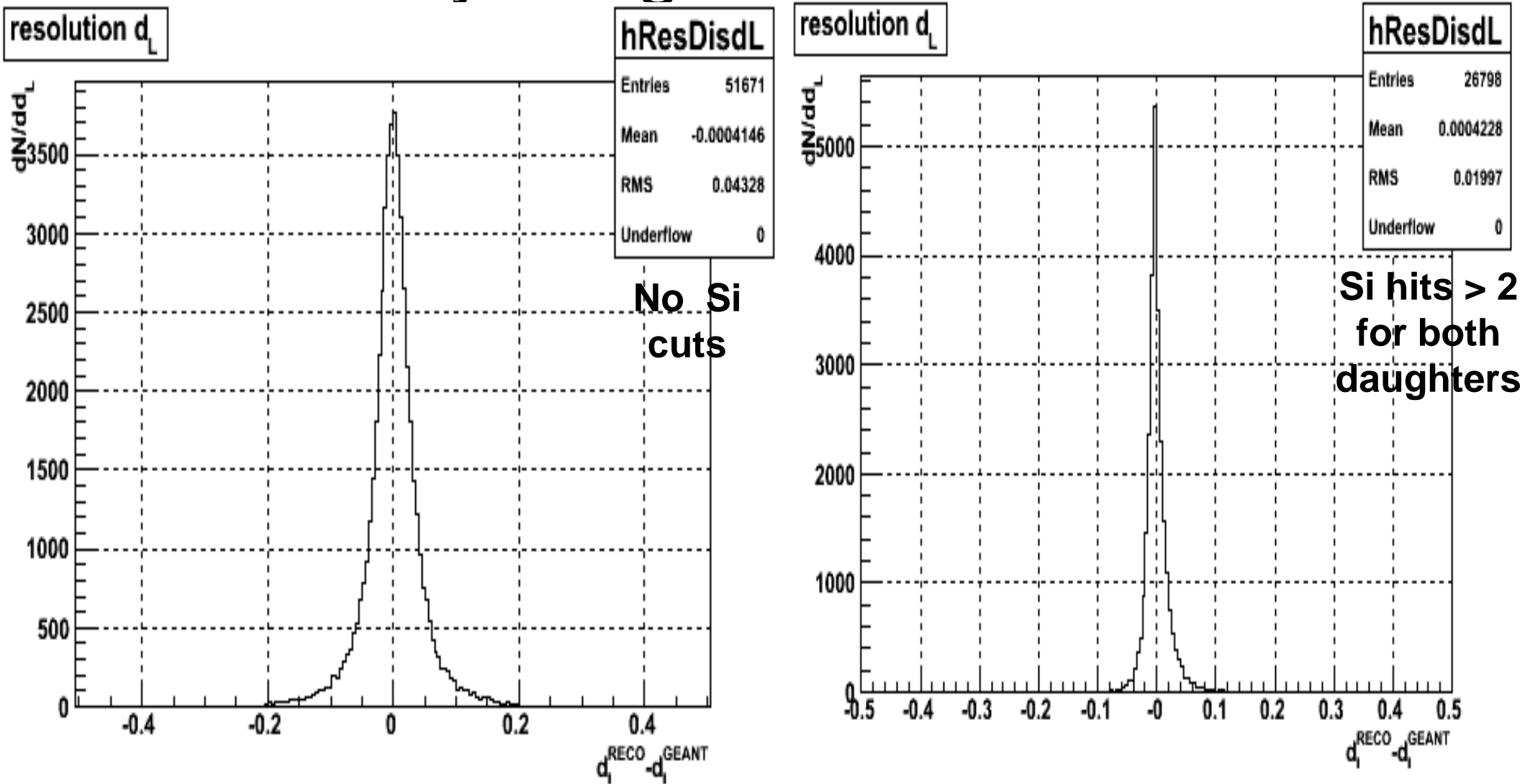
comparison with D0 from Geant : p_T resolution (sigma)

Fitted value of par[2]=Sigma



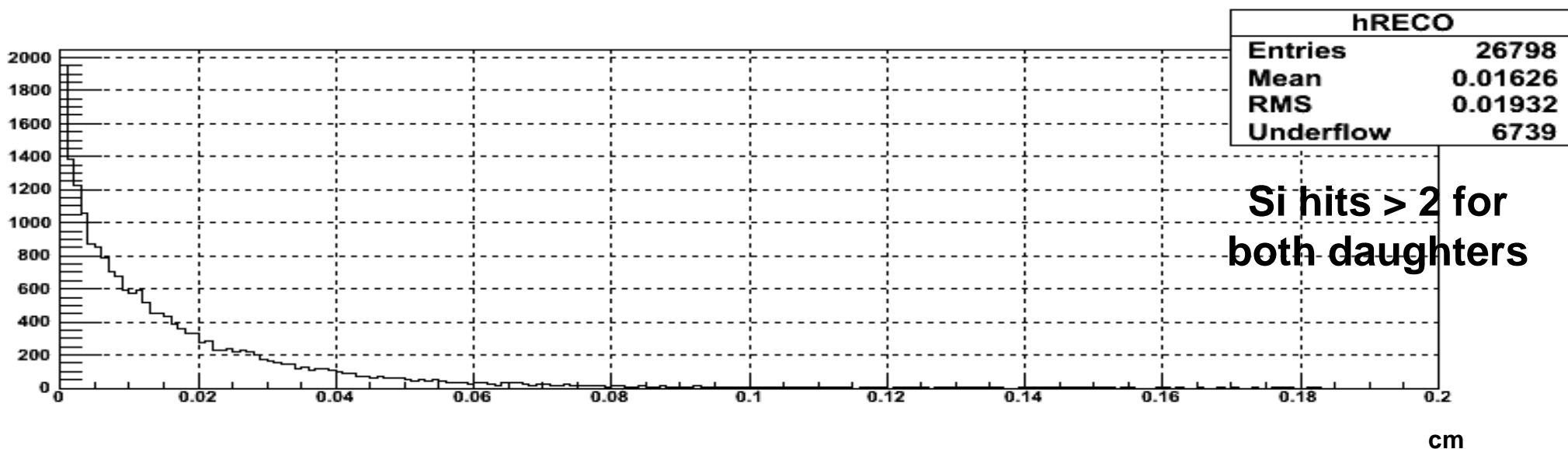
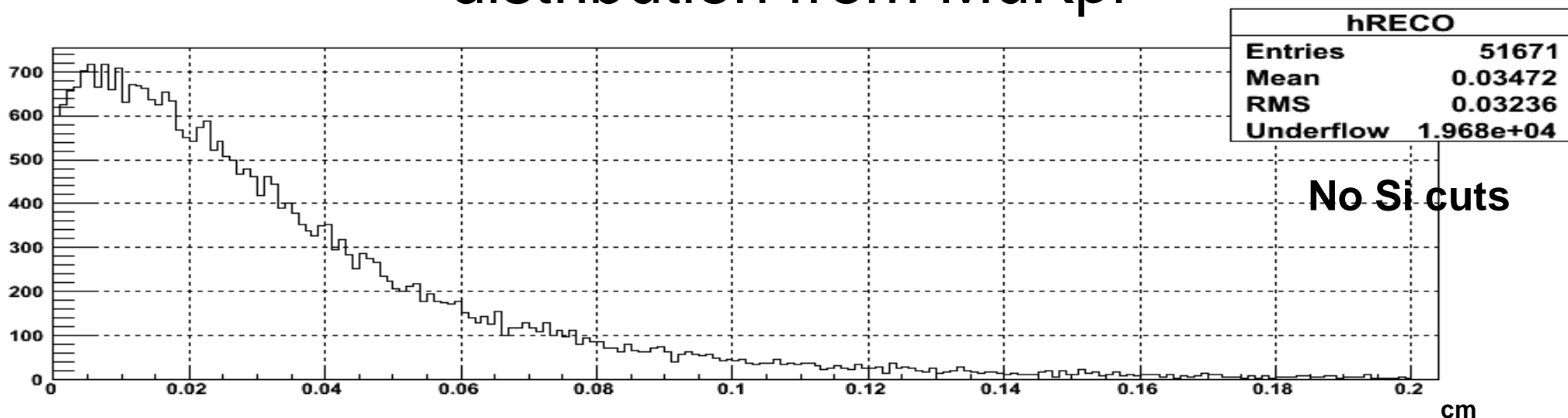
- σ_{p_T} increases when p_T increases
- slight increase for low p_T
- ~similar to single track p_T resolution

Comparison with D0 from Geant: Decay Length resolution [cm]



Calculated as secondary vertex position – primary vertex position (using g2t vertex table)

Comparison of D0 from Geant: Decay length distribution from MuKpi



Decay length shape distribution changes with respect to # of Si hits used.

Conclusion/to do

- Agreement btw GEANT and reconstructed data with MuKpi macro
- Decay length reconstruction may require more checks/studies, because we see fluctuations of $(dL_{\text{reco}} - dL_{\text{geant}})$ for certain dL_{geant} values.
- Test of the cut on D0 mix and real data